Table S1. Information on ginsenoside reference standards used for LC-MS identification

No.	Reference standard	Molecular formula	Supplier
1	Ginsenoside Rg1	C42H72O14	Refens Biotechnology Co., Ltd. (China)
2	Ginsenoside Rf	C42H72O14	Refens Biotechnology Co., Ltd. (China)
3	Ginsenoside Rg2	C42H72O13	Refens Biotechnology Co., Ltd. (China)
4	Ginsenoside Ro	C48H76O19	Refens Biotechnology Co., Ltd. (China)
5	(S)Ginsenoside Rh1	C36H62O9	Refens Biotechnology Co., Ltd. (China)
6	(R)Ginsenoside Rh1	C36H62O9	Refens Biotechnology Co., Ltd. (China)
7	Ginsenoside Rd	C48H82O18	Refens Biotechnology Co., Ltd. (China)
8	(R)Ginsenoside Rg2	C42H72O13	Refens Biotechnology Co., Ltd. (China)
9	Ginsenoside F1	C36H62O9	Refens Biotechnology Co., Ltd. (China)
10	Ginsenoside F2	C42H72O13	Refens Biotechnology Co., Ltd. (China)
11	Ginsenoside F4	C42H70O12	Refens Biotechnology Co., Ltd. (China)
12	Ginsenoside Ra2	C58H98O26	Refens Biotechnology Co., Ltd. (China)
13	Ginsenoside Rg6	C42H70O12	Refens Biotechnology Co., Ltd. (China)
14	Ginsenoside Rk3	C36H60O8	Refens Biotechnology Co., Ltd. (China)
15	Ginsenoside Rs2	C55H92O23	Refens Biotechnology Co., Ltd. (China)
16	Ginsenoside Rh4	C36H60O8	Refens Biotechnology Co., Ltd. (China)
17	(S)Ginsenoside Rg3	C42H72O13	Refens Biotechnology Co., Ltd. (China)
18	(R)Ginsenoside Rg3	C42H72O13	Refens Biotechnology Co., Ltd. (China)
19	Compound K	C36H62O8	Refens Biotechnology Co., Ltd. (China)
20	Ginsenoside Rk1	C42H70O12	Refens Biotechnology Co., Ltd. (China)
21	Ginsenoside Rg5	C42H70O12	Refens Biotechnology Co., Ltd. (China)
22	(S)Ginsenoside Rh2	C36H62O8	Refens Biotechnology Co., Ltd. (China)
23	(R)Ginsenoside Rh2	C36H62O8	Refens Biotechnology Co., Ltd. (China)

24	Ginsenoside Rs5 or isomer	C44H72O13	Refens Biotechnology Co., Ltd. (China)

Note: All reference standards were purchased from Refens Biotechnology Co., Ltd. (China). LC-MS, liquid chromatography-mass spectrometry

Table S2. Antibodies and staining reagents used in this study

Application	Target/Reagent	Supplier	Dilution
Western blot	Nrf2	Shanben Biotech, China	1:1500
Western blot	HO-1	Shanben Biotech, China	1:1500
Western blot	Cleaved caspase-3	Shanben Biotech, China	1:1500
Western blot	HSP70	Bioss, Beijing, China	1:2000
Western blot	HSP90	Bioss, Beijing, China	1:2000
Western blot	p-AKT	Bioss, Beijing, China	1:2000
Western blot	AKT	Bioss, Beijing, China	1:1000
Western blot	Bcl-2	Bioss, Beijing, China	1:2000
Western blot	Bax	Bioss, Beijing, China	1:2000
Western blot	IL-1β	CST, USA	1:2000
Western blot	TNF-α	CST, USA	1:2000
Western blot	NF-κB p65	CST, USA	1:2000
Western blot	p-NF-κB p65	CST, USA	1:2000
Western blot	p-IKK	CST, USA	1:2000
Western blot	IKK	CST, USA	1:2000
Western blot	LC3	CST, USA	1:1000
Western blot	P62	CST, USA	1:2500
Western blot	CHOP	CST, USA	1:2500
Western blot	GRP78	CST, USA	1:2500
Western blot	p-ERK	CST, USA	1:2500
Western blot	ERK	CST, USA	1:2500
Western blot	Occludin	Proteintech, Wuhan, China	1:2000

Western blot	Claudin-1	Proteintech, Wuhan, China	1:2000
Western blot	ZO-1	Proteintech, Wuhan, China	1:2000
Western blot	GAPDH		
Immunofluorescence	IL-1β	YuanTai Biotech, China	1:250
Immunofluorescence	TNF-α	YuanTai Biotech, China	1:250
Immunofluorescence	Occludin	Proteintech, Wuhan, China	1:250
Immunofluorescence	Claudin-1	Proteintech, Wuhan, China	1:250
Immunofluorescence	ZO-1	Proteintech, Wuhan, China	1:250
Fluorescence staining	Phalloidin	Biosharp, China	1:100

Table S3. Candidate active compounds of red ginseng retrieved from TCMSP

Ranking name	Mol ID	Molecule name
HS1	MOL012329	20(S)-Ginsenoside Rg3
HS2	MOL012335	20(R)-Ginsenoside Rg3
HS3	MOL002032	DNOP
HS4	MOL002372	(6Z,10E,14E,18E)-2,6,10,15,19,23-Hexamethyltetracosa-2,6,10,14,18,22-hexaene
HS5	MOL000358	β-Sitosterol
HS6	MOL005332	(3R,5R,8R,9R,10R,12R,13R,14R,17S)-17-[(2S)-2-Hydroxy-6-methylhept-5-en-2-yl]-4,4,8,10,14-pentamethyl-2,3,5,6,7,9,11,12,13,15,16,17-dodecahydro-1H-cyclopenta[a]phenanthrene-3,12-diol
HS7	MOL005334	(3S,5R,8R,9R,10R,12R,13R,14R,17S)-17-[(2S)-2-Hydroxy-6-methylhept-5-en-2-yl]-4,4,8,10,14-pentamethyl-2,3,5,6,7,9,11,12,13,15,16,17-dodecahydro-1H-cyclopenta[a]phenanthrene-3,12-diol

Note: The original TCMSP annotation for MOL012335 is “ginsenoside Rg3_qt”. It is presented here as 20(R)-Ginsenoside Rg3 to distinguish it from 20(S)-Ginsenoside Rg3.